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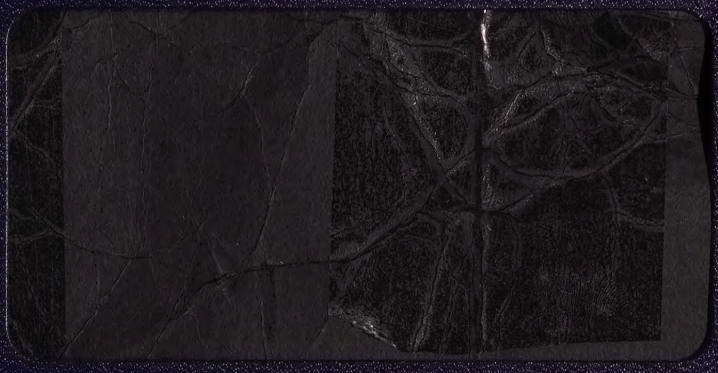

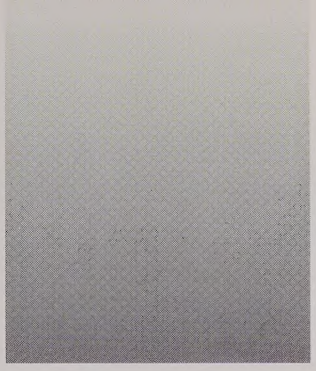

KALMUS
ENGINEERING

OPERATING AND SERVICE MANUAL
FOR MODEL 500FC
WIDEBAND RF POWER AMPLIFIER
PART NUMBER 1-60-408-001

SERIAL NUMBER 021993-2

Kalmus Engineering Inc.

(206) 485-9000 ■ (206) 486-9657 fax

21820 - 87th S.E. ■ Woodinville, WA. ■ 98072, USA

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KALMUS ENGINEERING

FINAL TEST DATA

Model 500FC Serial Number 021993-2

Description RF POWER AMPLIFIER

Date 02-19-93 Invoice

Customer MAGNAVOX

Frequency Range 1- 500 MHz

Average Gain 45 db Flatness (No ALC) ±1.5 db

(With ALC) —

Gain Adjust Range ±18db Meter Accuracy —

Linear Output 50 W Maximum Output 90 W

Harmonics 25 dbc (Typical) 22 dbc (Max)

Spurious -70 dbc VSWR Set 0.68V Sw open

Input Voltage Required 115V Amperes 5a

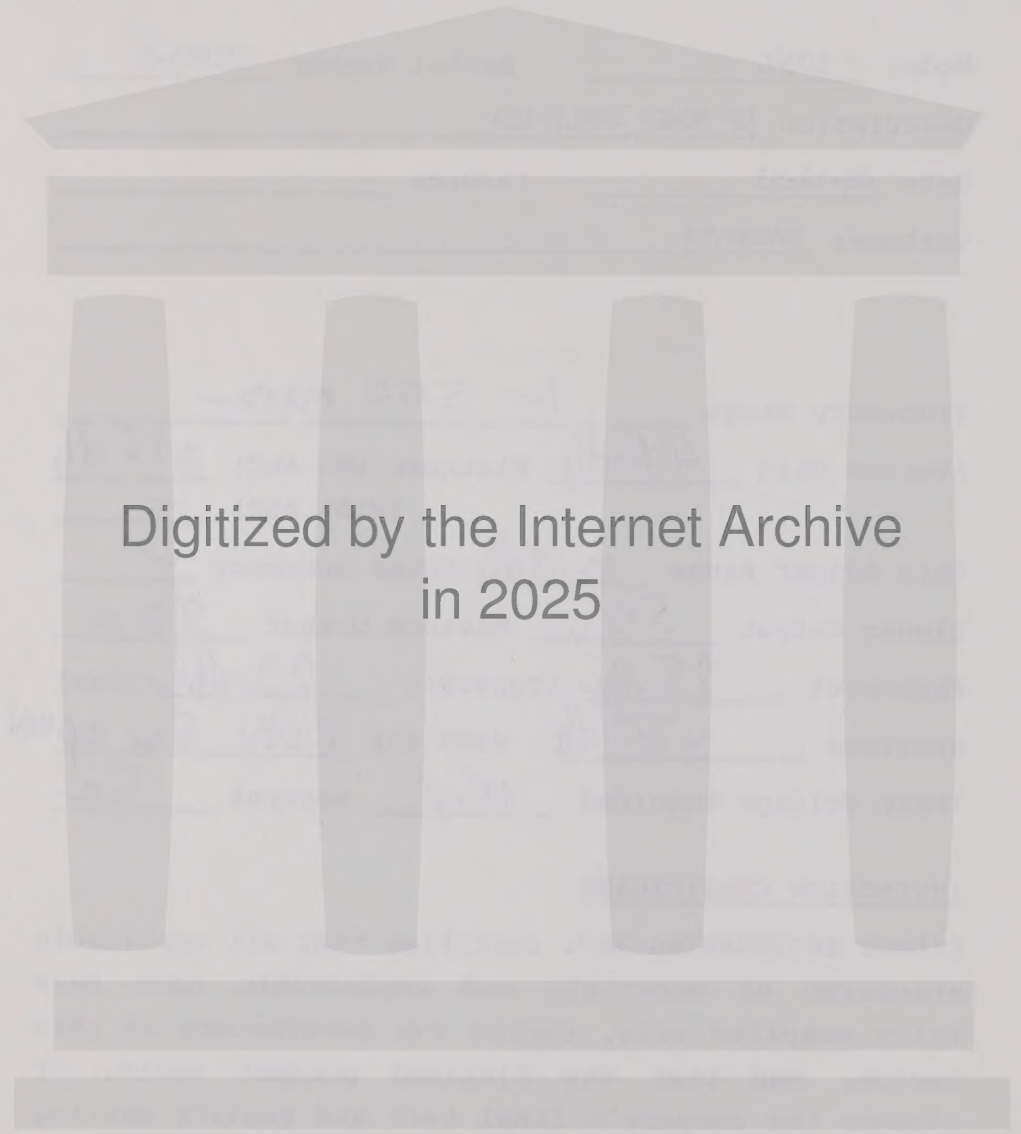
INSPECTION CERTIFICATE

KALMUS ENGINEERING INC. certifies that all applicable standards of materials and workmanship have been fully complied with, during the manufacture of this device, and that the finished product meets, or exceeds the company's final test and quality control specification standards.

Witnessed by [signature] Date FEB 19-93

Approved By [signature]

Kalmus Engineering Inc. ■ 21820 - 87th S.E. ■ Woodinville, WA. ■ 98072, USA ■ (206) 485-9000 ■ (206) 486-9657 fax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Certificate Of Compliance

KALMUS ENGINEERING

Customer MAGNAVOX Shipping Date 02-19-93

P.O. No: AZ-033957-VMR Part No. Model 500FC

W.O. No. 6079

It is hereby certified that the equipment shown below conforms to the requirements of your purchase order and is constructed from all new materials and in accordance with accepted industry workmanship practices. The measured performances meet or exceed the applicable specifications except as follows:

Equipment delivered under this document:

Description	Part No.	Serial No.
RF POWER AMPLIFIER	1-60-408-001	021993-2

The following additional requirements have been complied with:

Signed By:

Title:

Date: February 19, 1993

LIMITED WARRANTY

KALMUS ENGINEERING

Kalmus Engineering Inc. (**K.E.I.**) warrants each product to be free from defects in material and workmanship for a period of (18) eighteen months from invoice date. **K.E.I.** will repair the product at no charge for parts and labor should failure prove to have been caused by a factory defect as disclosed by our examination. Vacuum tubes are warranted for 90 days after invoice date.

This Warranty does not apply to:

1) Damage or malfunction caused by:
   a.) Accident, misuse, fire, lightning, or other acts of nature, unauthorized product modification, or failure to follow operational procedures provided with the product.
   b.) Installation or removal of the product to or from other equipment.
   c.) Any shipment of product to destination (claims to be filed with the freight carrier).
   d.) Any semiconductor failure when the system is not operated with a **K.E. I.** power supply.
   e.) Any other cause not attributable to product defect.
2) Any product which was not originally purchased from **K.E.I.** or an authorized representative.
3) Any product with removed or altered serial numbers.
4) Repair or attempted repair by anyone without written authorization from **K.E.I.**

Prior to returning any **K.E.I.** product for repair, please contact our service department at (800) 344-3341 for precise shipping instructions. Freight shipped without prior factory authorization may be rejected and returned to sender. Collect shipments are not accepted, however **K.E.I.** will pay for freight charges back to customer for warranty repairs.

For out-of-warranty repairs **K.E.I.** will submit an estimate for approval prior to actual repair.

All **K.E.I.** products needing to be returned for service should include written correspondence describing events leading to failure and should be addressed with freight prepaid, to the address below.

K.E.I.'S LIABILITY FOR ANY DEFECTIVE PRODUCT IS LIMITED TO THE REPAIR OR REPLACEMENT OF THE PRODUCT AT OUR OPTION. K.E.I. SHALL NOT BE RESPONSIBLE FOR:

1. DAMAGE TO OTHER PROPERTY CAUSED BY ANY DEFECTS IN THIS PRODUCT, DAMAGES BASED UPON INCONVENIENCE, LOSS OF USE OF THE PRODUCT, LOSS OF TIME, OR
2. ANY OTHER DAMAGES, WHETHER INCIDENTAL, OR CONSEQUENTIAL.

THERE ARE NO OTHER WARRANTIES, EITHER EXPRESS OR IMPLIED, INCLUDING ANY WARRANTY OF MERCHANTABILTY OR FITNESS FOR A PARTICULAR USE.

Kalmus Engineering Inc. 21820 - 87th S.E., Woodinville, WA. 98072, USA

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1.0 DESCRIPTION AND OPERATION

This manual covers the **Kalmus Engineering** Model 500FC Wideband RF Power Amplifier and presents a general description of operation, specifications, circuit description, operation and maintenance instructions, an itemized parts list and schematics and assembly drawings.

This model provides 50 Watt CW power over the frequency range of 1 to 500 MHz with 47 dB power gain. No tuning, bandswitching, or adjustments of any kind are required in the operation of this unit.

The Model 500FC is constructed in a 5-1/4 inch high cabinet, 18 inches deep, and mounts into a standard, 19-inch equipment rack. Input and output connectors are located on the front panel. Cooling is provided by three, highly reliable, tube-axial fans installed on the rear panel. Air intake is through openings in the side panels. Construction of the unit is modular so that all subassemblies are readily removable for service. Power is supplied by two, switching-type power supply modules.

VSWR and over-temperature protection are standard features. LED type indicators show the status of these on the front panel . A 10-segment bargraph provides output power indication. Rf gain control is standard and provides about 12 dB of attenuation on the rf input signal by means of varying the forward bias on a pin-diode attenuator circuit.

A 25-pin, D-subminiature connector on the rear panel provides for the remote operation of the unit for the following functions: power on/off control, rf gain control, output power indication, VSWR indication, over-temperature indication and power supply voltage test points.

1.2 SPECIFICATIONS

Frequency Range	: 1-500 MHz broadband
Power Output	: 50 Watt CW minimum
Power Gain	: 47 dB nominal
Gain Control	: 20 dB typical
Gain Flatness	: +/- 2.0 dB maximum
Input Impedance	: 50 Ohm nominal
Output Impedance	: 50 Ohm nominal
Duty Factor	: 100%
Spurious Outputs	: -65 dBc maximum
Harmonic Distortion	: -20 dBc maximum
Input Power	: 0 dBm typical
VSWR Tolerance	: infinite
Protection	: Overtemp, VSWR
Class of Operation	: Class A Linear
Temperature Stability	: better than 0.8 dB
Operating Temperature	: 0 to 45 degrees C
Connectors	: type N-jack
Cooling	: forced air
Panel Meter	: bargraph rf power indicator
Indicators	: AC On/Off, TEMP, VSWR,
Remote Capability	: power on/off, rf gain control, output power ind., VSWR ind., over-temp ind.
Primary Power Required	: 100-240V 50/60Hz 600VA
Size (W X D X H)	: 19 X 18 X 5.25 in 480 X 460 X 133 mm
Weight	: 32 lbs, 14.6 kg

FUNCTION	REMOTE CONNECTOR PIN NUMBER	EXTERNAL CONNECTION
PS1 Test (+28 VDC)	5	maximum load 100K
PS2 Test (+28 VDC)	6	maximum load 100K
+28 VDC for Ext. RF Gain Ctrl	9	2.5K LIN. TAPER
Ext. RF Gain Ctrl in, 0-28 V	10	
Ext. Refl. Pwr Indication	11	maximum load 10K
Ext. VSWR Fault Indicator	13	Imax. 20mA
Ext. Temp. Fault Indicator	14	Imax. 20mA
common ground	23	
AC Power ON/OFF Ctrl (+) **	24	For remote operation the local power switch must be left in the ON position. 0 to 0.5 V, short circuit, or open circuit between pins 24 and 25 turns unit on. + 2.4 to + 5 V turns unit off.
AC Power ON/OFF Ctrl (-) **	25	

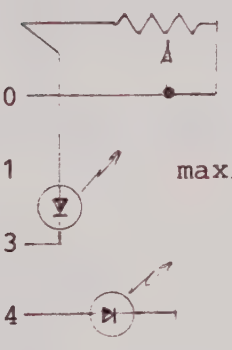


FIGURE 1 -- INPUT/OUTPUT DIAGRAM REMOTE CONNECTOR

1.3 CIRCUIT DESCRIPTION

The Model 500FC uses four, standard amplifier modules, Model 520F, combined by a 4-way combiner, to obtain 50 Watt of output power into a 50 Ohm load. The input signal is preamplified by a hybrid rf amplifier circuit. The amplified signal is split four ways and applied to the inputs of the four power amplifier modules via two pin-diode attenuator circuits which provide for rf gain control and vswr protection. The outputs are combined with a 4-way, in-phase combiner. The combiner output is directed to the unit output connector via a reflectometer which provides a sample of the amount of reflected power present on the output for the vswr protection circuitry.

The following subassemblies comprise the Model 500FC and are described in some detail:

A. PREAMPLIFIER/4-WAY SPLITTER, A1
B. AMPLIFIER MODULE 520F, A2 - A5
C. VSWR PROTECTION CIRCUIT, A7 AND A6
D. RF POWER INDICATOR, A8 AND A9
E. POWER SUPPLY MODULE, PS1, PS2

A. PREAMPLIFIER/4-WAY-SPLITTER, A1
(see drawing 7-38-280-000)

The preamplifier is a hybrid rf amplifier circuit providing about 7 dB gain and excellent input matching. This amplifier is followed by two pin-diode attenuator circuits. CR1 and CR2 form a series-type attenuator which is used as an rf switch for VSWR protection. These diodes are normally biased on. When a severe VSWR condition occurs these diodes are biased off under control of the VSWR protection circuit. CR3 and CR4 form a shunt-type attenuator circuit with the forward bias under continuous control of the front panel rf gain control. This provides for about 12 dB of attenuation on the input signal.

R7 through R12 constitute a 4-way splitter circuit dividing the output of the preamplifier into four equal, in-phase signals for the four output power amplifiers.

B. AMPLIFIER MODULE 520F, A2 - A5
(see schematic 7-35-579-000)

The input signal at J1 is applied to the first amplifier stage, A1. A1 is a Motorola micro-circuit which provides 8 dB gain over the entire frequency band. RFC2 enhances high frequency amplification. R1 sets the quiescent current for

Q1; nominally set for 200 mA. R3 provides current limiting for A1.

The gain in Q1 is approximately 10 dB. C6/R8 constitute a low frequency attenuator; C7 is a high frequency peaking capacitor. The output of Q1 is applied to the gate of Q2. R10 and C11 form a feedback circuit which maintains constant gain over the frequency range of the amplifier. R6 is set for 300 mA quiescent current. Q3 is another gain stage with frequency response shaping. The quiescent current of Q3 is set with R20 to 400 mA. The output of Q3 is applied to the push-pull final stage via phase splitter T1. C18 is a high frequency peaking capacitor. R14 and R15 are the bias resistors fed by R13. R13 is adjusted for a total drain current for Q3 of 800 mA. R16/R17/C20/C21 are gain stabilization components. C28 another peaking capacitor. The output of the push-pull output stage is phase combined by T2. VR1 and VR2 are the bias regulators.

C. VSWR PROTECTION CIRCUIT, A7 AND A6
(see drawing 7-38-280-000 and schematic 7-35-384-000)

VSWR protection is realized by sampling the reflected power level by means of a bi-directional coupler or reflectometer, A6.

This coupler is connected in the RF output line and the coupled output is connected to the VSWR protection circuit board, A3, REV input, pin 2. This input is applied to comparator U1-C with threshold adjustment R4 on the inverting input. When the voltage presented to pin 2 of the VSWR board exceeds the threshold voltage, the output of the comparator U1-C will go "high" as will the output of U1-D.

This switches Q3 on which in turn triggers the "monostable" U2. Its output goes high and remains high until about 1 second after the removal of the trigger input received from Q3.

The high output from the "monostable" switches on Q1 which provides a low output to pin 3 of the VSWR board to operate the pin-diode switch of the amplifier module to the off state thus inhibiting the rf signal. Simultaneously, U1-B, U1-A and Q2 serve to activate the fault indicator(s), which may be an LED indicator or an piezo electrical transducer or both. U1-B and U1-A form a multivibrator operating at the pulse rate of about 1 second thus producing a flashing indication and beeping alarm sound.

This condition will automatically terminate about one second after the reason for the excessive VSWR condition has been removed.

D. RF POWER INDICATOR, A8 AND A9
(see schematic 7-35-617-000)

RF output power indication is provided on the front panel by a 10-segment bargraph. The lower and upper limits of the bargraph indicator are marked MIN and MAX, with MAX indicating the amplifier's rated output power.

The amplifier's output power is sampled at the output connector with rf detector A9. This signal is applied to the input of 10-segment bargraph driver, U1, via operational amplifier U3 which provides calibration adjustment with R1. VR1 supplies the 12 Volt for this circuit.

E. POWER SUPPLY MODULE, PS1 AND PS2
(see APPENDIX)

The power supply module is a standard, commercial item, Model LFS43-28, manufactured by Lambda Electronics, Melville, NY 11747.

2.0 OPERATION AND MAINTENANCE

2.1 OPERATION

Prior to installation and/or use of the instrument, a thorough visual inspection should be made to detect any shipping damage. The equipment is designed to withstand normal physical environments encountered during shipping, but occasionally damage can occur. If it does, it should be reported immediately. The reusable shipping container should be retained until the user is certain the equipment is performing to specification.

A. COOLING

It is essential that the 500FC forced-air cooling system be allowed to operate at maximum efficiency in order to maintain operation of the individual components within their ratings. Cooling is dependent upon the free flow of cooling air through the sides and top of the unit. Therefore, care should be exercised to keep these areas free of any objects that could obstruct this free air flow.

B. SAFETY PRECAUTIONS

There are no special safety precautions to be observed. Input to the unit should not exceed 1 Volt peak to peak. Damage due to output mismatch is avoided by the fast reacting protection circuit which automatically removes rf drive from the amplifier final stages until the output has been properly matched.

C. CONNECTION TO POWER SOURCE

The 500FC operates from either 95-132 VAC or 187-250 VAC, 50/60 Hz. The unit has been wired for operation from either 120 VAC or 220 VAC as requested at the time of order. Should operation be required at a different line voltage outside of the range for which the unit is wired, an internal wiring change must be made at the power supply module. Refer to the appendix describing the power supply module for this.

The unit is connected to the power source with the line cord provided.

D. FRONT PANEL CONTROLS AND INDICATORS

The 500FC amplifier has no critical adjustments and therefore has few controls which require attention.

POWER -- Turns equipment ON and OFF.

TEMP -- Lights when amplifier temperature exceeds 160 degrees F.

VSWR -- Flashes when output mismatch VSWR exceeds preset limit. (usually 2:1)

ADJUST -- Provides about 12 dB of attenuation on the input signal.

E. PLACING EQUIPMENT IN SERVICE

It is good practice to follow the procedure below for placing the equipment in service:

a. Make sure equipment is connected to the appropriate power source.

b. Make sure appropriate load is connected. Impedance should be approximately 50 Ohm resistive and power rating should be at least 50 Watt.

c. Without signal applied to the input, switch the POWER switch to the ON position. The AC light will come on and the fans will start.

d. Apply an input signal within the frequency range of the amplifier and slowly increase the drive level until rated output power is achieved.

F. FUSES

Two, 4 Amp, 5 X 20 mm, time-delay type fuses are located in the fuse clip which is part of the AC power module on the rear panel. If these fuses blow, chances are your amplifier has a problem. It is suggested that a check be performed prior to replacing the fuses to avoid damage to the equipment.

2.2 MAINTENANCE

No maintenance is required for the 500FC

3.0 ITEMIZED PARTS LIST

The Itemized Parts List provides a breakdown of the equipment covered by this manual. Illustrations are limited to the assembly drawings of the individual sub-assemblies. The breakdown is by assembly and all part numbers are in-house identification numbers. Generally all parts are available from stock and may be ordered from:

KALMUS ENGINEERING INTERNATIONAL, LTD.

21820 87TH SE

WOODINVILLE, WASHINGTON 98072

Telephone (206) 485-9000

FAX (206) 486-9657

PARTS LIST
FOR
RF POWER AMPLIFIER, MODEL 500FC
PART NUMBER 3-60-408-001

REF DESIGNATOR	QTY	DESCRIPTION	PART NUMBER
	1	DC100D ASSY COUPLER 1-500MHZ 100W	3-60-439-004
	1	VSWR PROTECT PCB ASSY	4-30-271-001
	1	PCB ASSY BARGRAPH	4-30-326-001
	1	PCB ASSY PRE-AMP/SPLITTER ASSY	4-30-333-001
	4	AMPLIFIER ASSY 505F 1-500MHZ 5-10W	4-62-166-002
J2	1	CONNECTOR SUHNER# 22N-50-0-2	7-19-072-001
J3	1	CONNECTOR FILTER KFA 4301-5003	7-19-085-001
MATE	1	CONNECTOR D-SUBMIN 117D SERIES	7-19-047-025
PS1 PS2	2	POWER SUPPLY REG 28V 8.6A	7-28-006-028
TB2	3	TERMINAL STRIP	7-20-008-005
	1	RESISTOR CF 1/4W 1K	7-01-201-102
	3	RESISTOR CF 1/2W 1K	7-01-202-102
	1	RESISTOR CF 1/2W 10K	7-01-202-103
	1	RESISTOR MF 2W 1K	7-01-304-102
	1	RESISTOR MF 2W 2K	7-01-304-202
	2	RESISTOR MF 2W 62 OHM	7-01-304-620
	1	POTENTIOMETER S-TAPER 2W 2.5K	7-02-002-252
	2	INDICATOR ASSY LED RED	7-12-028-002
	1	INDICATOR ASSY LED GREEN	7-12-028-005
	1	FUSE DRAWER W/O VOLT SEL INSERT	7-14-007-002
	1	SOCKET 10A 300VF	7-15-008-002
	2	CLIP HOLD-DOWN RELAY (SET)	7-15-012-001
	4	SWITCH THERMAL 160 DEG NC	7-16-004-160
	1	SWITCH C&K	7-16-020-001
	1	RELAY FILTER 24VDC	7-17-008-001
	1	FAN DC 24V 1.7W	7-18-107-001
	2	FAN DC 24V	7-18-202-001
	2	FAN GUARD FOR 4.5 INCH FAN	7-18-205-001
	1	FAN GUARD FOR 3 INCH FAN	7-18-205-002
	1	HOUSING CONNECTOR 4 POS 22-01-10	7-19-002-004
	3	TERMINAL CRIMP 2759 SERIES M	7-19-003-001
	5	CONNECTOR POWER PLUG 4-POS	7-19-004-004
	20	CONNECTOR PIN RECEPT	7-19-005-001
	20	CONNECTOR PIN PLUG	7-19-005-002
	1	CONNECTOR BNC JACK UG1094/U	7-19-010-001
	5	MOLEX CONNECTOR RECEPT 4-POS	7-19-016-004
	1	CONNECTOR CARD EDGE 10 PIN	7-19-036-010
	1	CONNECTOR 25 PIN RECEPT	7-19-046-025
	3	CONNECTOR #16-BNC-50-3-7C	7-19-059-001
	1	CONNECTOR BNC PLUG 90DEG RG188	7-19-059-002
	1	CONNECTOR BNC NEWARK 39F1442	7-19-060-001
	8	CONNECTOR SMA 90DEGREE RG174/1	7-19-063-002

REF DESIGNATOR	QTY	DESCRIPTION	PART NUMBER
	9	CONNECTOR SMA MALE RG174/188	7-19-064-002
	1	SCREWLOCK FEMALE D20418-2	7-19-093-001
	1	SCREW RETAINER D2041	7-19-093-002
	1	SHELL SWITCHING FOR DB25 CONN	7-19-124-025
	3	TERMINAL #1491-7-11	7-20-015-001
	2	HANDLE BLACK	7-21-001-001
	1	KNOB 1/4" ALCO #KNS501BA	7-21-006-001
	4	FEET RUBBER	7-23-002-001
	13	CORE TOROIDAL 26430063	7-24-008-002
	3	CORE TOROIDAL 5943001901	7-24-021-001
	1	COMBINER 4-WAY 1-500MHz 100W	7-27-035-001
	1	CORD LINE BLACK W/2 PLUGS	7-29-205-018
	1	AMPLIFIER MOUNTING PLATE	7-40-006-001
	1	SPLITTER MOUNTING PLATE	7-40-007-001
	4	SHIM HEATSINK	7-40-017-001
	1	PWB SPLITTER COVER	7-40-018-001
	3	BRACKET LED MOUNTING	7-40-089-001
	1	MOUNTING RAIL RELAY (RAW STOCK	7-41-530-001
	1	BRACKET PC BOARD MTG	7-41-553-001
	1	CHASSIS	7-41-978-001
	1	REAR PANEL	7-41-979-001
	1	500FC FRONT PANEL	7-41-981-001
	1	COVER	7-41-983-001
	4	COVER MACHINED C SIZE +28V	7-42-023-001
	1	BAR PC BOARD RETAINER	7-42-037-001
	4	STANDOFF	7-51-007-004

Model 500FC

REF DESIGNATOR	QTY	DESCRIPTION	PART NUMBER
		VSWR PROTECT PCB ASSEMBLY	**4-30-271-001**
C1 C11 C10	3	CAPACITOR ELECTR AXL 35V 22MF	7-03-702-226
C12	1	CAPACITOR ELECTR RAD 50V 1MF	7-03-704-105
C2	1	CAPACITOR CER 50V Z5U .01UF	7-03-502-103
C4	1	CAPACITOR ELECTR RAD 50V 10MF	7-03-704-106
C6	1	CAPACITOR CER 100V X7R 1.0MF	7-03-501-105
C9 C3 C5	3	CAPACITOR CER 50V Z5U .1UF	7-03-502-104
D1 D3	2	DIODE SIGNAL 1N914	7-06-003-001
D2	1	DIODE ZENER 1W 5% 13V 1N4743A	7-06-001-013
Q1 Q3	2	TRANSISTOR GP NPN 2N4400	7-07-030-001
Q2	1	TRANSISTOR GP PNP 2N4402	7-07-022-001
R1 R8 R18	3	RESISTOR CF 1/4W 47K	7-01-201-473
R10	1	RESISTOR CF 1/4W 3.9K	7-01-201-392
R11	1	RESISTOR CF 1/2W 750K	7-01-202-754
R12 R24	2	RESISTOR MF 2W 1K	7-01-304-102
R14	1	RESISTOR CF 1/4W 4.7K	7-01-201-472
R15 R23 R25	3	RESISTOR CF 1/4W 10K	7-01-201-103
R16	1	RESISTOR CF 1/2W 750 OHM	7-01-202-751
R2 R19 R22	3	RESISTOR CF 1/4W 30K	7-01-201-303
R20	1	RESISTOR CF 1/4W 56K	7-01-201-563
R26	1	RESISTOR CF 1/4W 2.2M	7-01-201-225
R26	1	RESISTOR CF 1/2W 1K	7-01-202-102
R27	1	RESISTOR CF 1/4W 110K	7-01-201-114
R3 R7 R17 R21	4	RESISTOR CF 1/4W 220K	7-01-201-224
R4	1	POTENTIOMETER TRIMMING 1T 1/4W 30K	7-02-003-303
R5 R9	2	RESISTOR CF 1/4W 100K	7-01-201-104
R6	1	RESISTOR CF 1/4W 150K	7-01-201-154
TP1	1	TEST POINT BLACK	7-19-098-001
TP2	1	TEST POINT RED	7-19-098-002
TP3	1	TEST POINT WHITE	7-19-098-003
U1	1	IC COMPARATOR QUAD #LM339N	7-08-002-001
U2	1	IC TIMER MC1455P-1	7-08-011-001
	1	SOCKET IC 8 PIN	7-15-002-008
	1	SOCKET IC 14 PIN 802-014-1642	7-15-002-014
	1	PCB VSWR DUAL PROTECTION	7-30-271-001
	1	BRACKET PLUG-IN PC MOUNTING	7-41-547-001

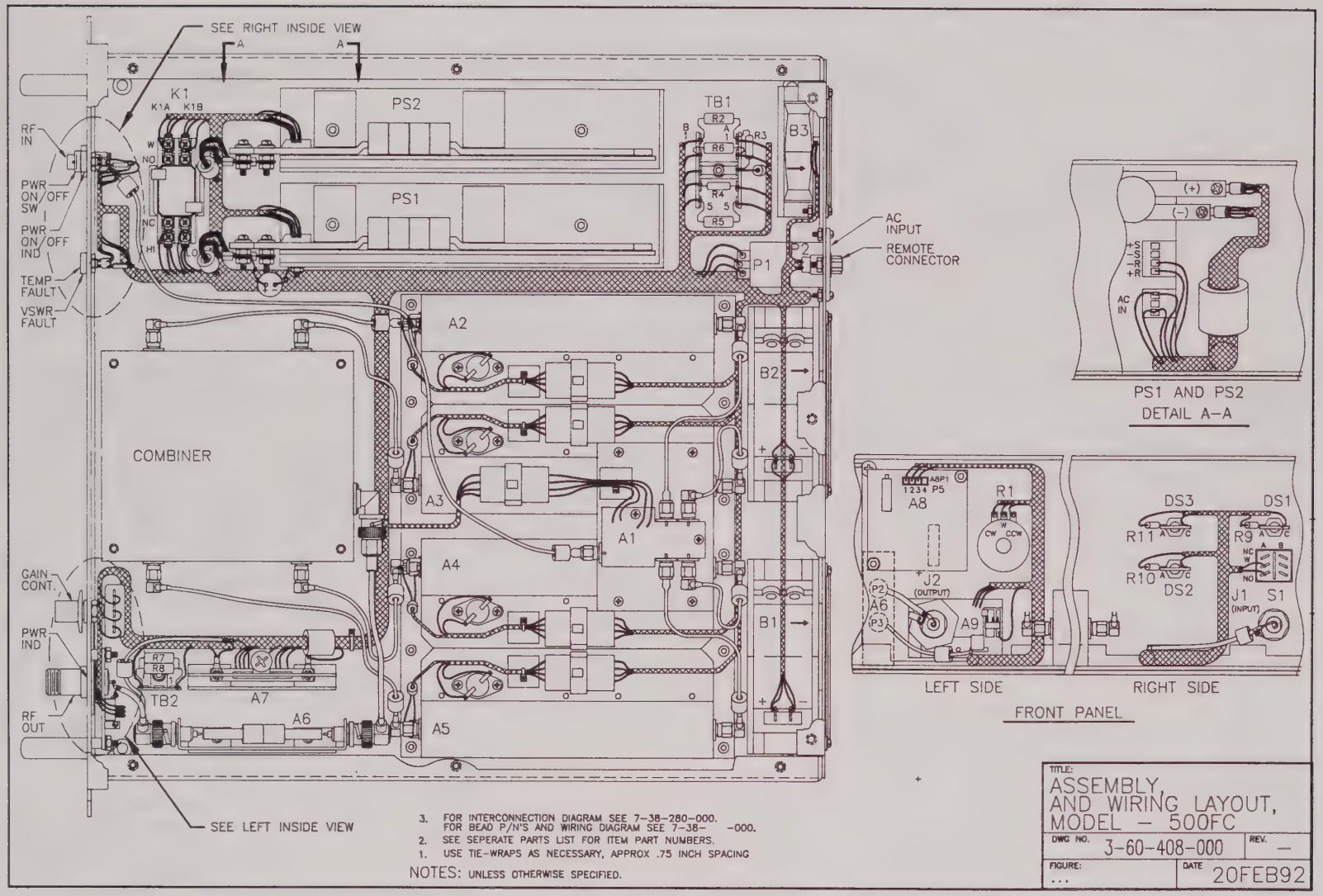
REF DESIGNATOR	QTY	DESCRIPTION	PART NUMBER
		PCB ASSEMBLY BARGRAPH	**4-30-326-001**
C1	1	CAPACITOR ELECTR AXL 16V 47MF	7-03-711-476
C2 C3	2	CAPACITOR CER 100V X7R 1.0MF	7-03-501-105
P1	1	HEADER PCB 4-PIN	7-19-006-004
R1	1	POTENTIOMETER TRIMMING 15T 1W 5K	7-02-005-502
R2 R6	2	RESISTOR CF 1/4W 1K	7-01-201-102
R3	1	RESISTOR CF 1/4W 820 OHM	7-01-201-821
R4 R5	2	RESISTOR CF 1/4W 2K	7-01-201-202
U1	1	IC DISPLAY DRVR LM3914J	7-08-005-001
U2	1	BARGRAPH HDSP-4820 10-SEG RE	7-12-003-001
U3	1	IC OP AMP #CA3140E	7-08-006-001
	1	IC REGULATOR 12V MC78M12CT	7-08-013-004
	1	PCB	7-30-326-001
		PCB ASSEMBLY PRE-AMP/SPLITTER	**4-30-333-001**
A1	1	AMPLIFIER HYBRID MWA230	7-10-003-001
C1 C2	2	CAPACITOR CER CHIP ATC200 .01UF	7-03-412-103
C3 C4 C5 C6 C7	5	CAPACITOR CER CHIP ATC200 .1UF	7-03-412-104
CR1 CR2 CR3 CR4	4	DIODE HOT-CARRIER HP5082-3080	7-06-013-001
J1 J2 J3 J4 J5	5	CONNECTOR SMA FEMALE FLANGE	7-19-079-001
L1	1	INDUCTOR ASSY RFC 2T 28 MAG	4-05-110-002
R1 R2	2	RESISTOR CF 1/2W 1K	7-01-202-102
R12	1	RESISTOR CF 1/4W 51 OHM	7-01-201-510
R3 R4	2	RESISTOR CF 1/4W 2K	7-01-201-202
R5 R6	2	RESISTOR CF 1/4W 1K	7-01-201-102
R7	1	RESISTOR CF 1/2W 20 OHM	7-01-202-200
R8 R9 R10 R11	4	RESISTOR CF 1/4W 33 OHM	7-01-201-330
	1	PCB PRE-AMP/SPLITTER 500FC	7-30-333-001
	4	STANDOFF	7-51-007-004
		AMPLIFIER ASSEMBLY 505F	**4-62-166-002**
	1	AMP PCB ASSY 505/510/520F	4-30-266-004
Q1	1	FET PWR TMOS N D2001	7-07-091-003
Q2	1	FET PWR TMOS N LF2805A (RF2256)	7-07-106-001
Q3	1	FET PWR TMOS N D1008 UHF 40W	7-07-089-002
	1	CAPACITOR 3000 PF FT WITH NUT	7-03-417-302
	2	CONN COAX SMA RECPT P	7-19-009-001
	1	LUG GROUND #4	7-20-013-004
	1	CHASSIS MACHINED SIZE C 505F	7-42-022-005
	1	COVER MACHINED C SIZE +28V	7-42-023-001

REF DESIGNATOR	QTY	DESCRIPTION	PART NUMBER
		AMPLIFIER PCB ASSEMBLY	**4-30-266-004**
A1	1	AMPLIFIER HYBRID MWA230	7-10-003-001
C1	1	CAPACITOR ELECTR AXL 63V 220MF	7-03-701-227
C15 C25	2	CAPACITOR ELECTR AXL 35V 22MF	7-03-702-226
C18 C32	2	CAP CER VAR 250V 3-10PF .22 DIA	7-04-005-100
C2 C5 C6 C10 C11 C12 C14 C20 C21 C22 C23 C24 C41 C16 C34 C38	16	CAPACITOR CER 50V Z5U .1UF	7-03-502-104
C27 C29	2	CHIP CAPACITOR .1UF 100V	7-03-301-104
C3 C4 C17 C19	4	CAPACITOR CER CHIP ATC200 .1UF	7-03-412-104
C33 C28	2	CAPACITOR PORC CHIP ATC100 6.8PF	7-03-411-689
C39	1	CAPACITOR 43 PF SMC 250V 5%	7-03-201-430
C40	1	CAPACITOR PORC CHIP ATC100 15PF	7-03-411-150
C7 C35 C37	3	CAPACITOR PORC CHIP ATC100 36PF	7-03-411-360
L3 L4	2	INDUCTOR ASSY RFC 22T 22 MAG	4-05-184-022
L5	1	INDUCTOR RF AIR 2T #22 ON .110 DIA	7-05-010-002
R1 R6 R13	3	POTENTIOMETER TRIMMING 20T 1/2W 20K	7-02-007-203
R10	1	RESISTOR CF 1/2W 300 OHM	7-01-202-301
R14 R15	2	RESISTOR CF 1/2W 10K	7-01-202-103
R16 R17	2	RESISTOR MF 2W 220 OHM	7-01-304-221
R19	1	RESISTOR CF 1/4W 2K	7-01-201-202
R2 R7	2	RESISTOR CF 1/4W 4.7K	7-01-201-472
R3	1	RESISTOR MF 2W 510 OHM	7-01-304-511
R4	1	RESISTOR CF 1/2W 10 OHM	7-01-202-100
R5 R11	2	RESISTOR CF 1/4W 20K	7-01-201-203
R8 R24 R26	3	RESISTOR CF 1/4W 39 OHM	7-01-201-390
RFC1	1	INDUCTOR ASSY RFC 2T 28 MAG	4-05-110-002
RFC3 RFC5	2	INDUCTOR ASSY RFC 33T 28 MAG	4-05-008-001
RFC7 RFC8 RFC4 RFC6	4	INDUCTOR ASSY RFC 2T 22 MAG	4-05-161-001
T1	1	TRANSFORMER ASSY RF 2T 50.037	4-05-018-001
2	1	TRANSFORMER ASSY RF 50.037	4-05-019-001
VR1 VR2	2	IC REGULATOR VOLTAGE +12V LM78L12AC	7-08-015-003
	1	CAPACITOR PORC CHIP ATC100 10PF	7-03-411-100
	1	PCB 505F BD	7-30-266-001

4.0 LIST OF DRAWINGS

	Drawing Number
500FC Assembly	3-60-408-001
Interconnect Diagram	7-38-280-000
Preamplifier/Splitter Assembly (-001)	4-30-333-000
Schematic Preamplifier/Splitter	7-35-625-000
Amplifier Assembly 505F (-002) (PCB Amplifier Assembly (-004)	*4-62-166-000 *4-30-266-000)
Schematic 505F	7-35-352-000
PCB Assembly VSWR Protection (-001)	4-30-271-000
Schematic PCB VSWR Protection	7-35-384-000
RF Power Indicator Assembly (-001)	*4-30-326-000
Schematic RF Power Indicator	7-35-617-000
Power Supply LFS43-28	APPENDIX

* These items where not available at the time of preparation of this manual. Please contact Kalmus Engineering Customer Service when these are needed.

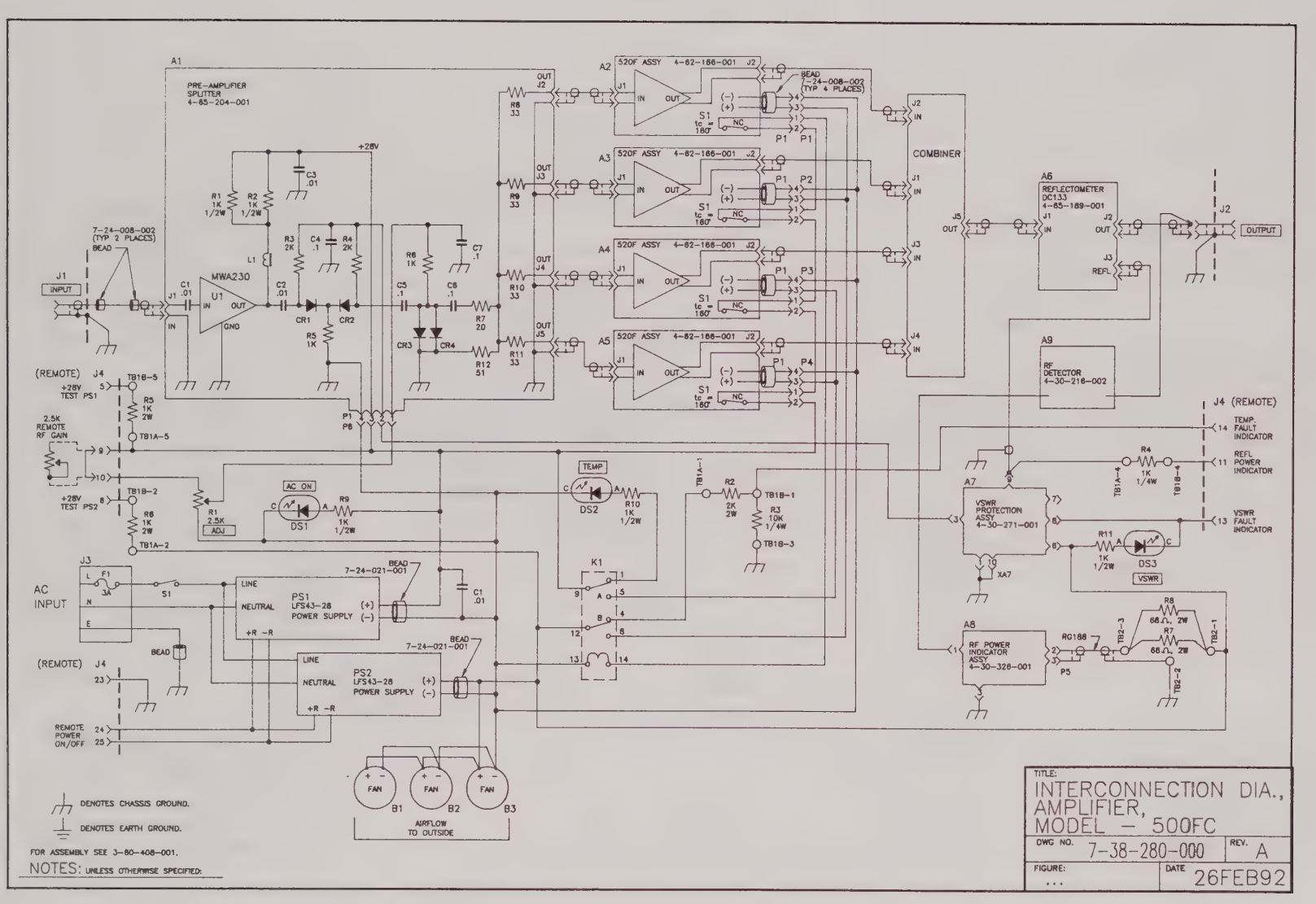


3. FOR INTERCONNECTION DIAGRAM SEE 7-38-280-000. FOR BEAD P/N'S AND WIRING DIAGRAM SEE 7-38- -000.
2. SEE SEPERATE PARTS LIST FOR ITEM PART NUMBERS.
1. USE TIE-WRAPS AS NECESSARY, APPROX .75 INCH SPACING

NOTES: UNLESS OTHERWISE SPECIFIED.

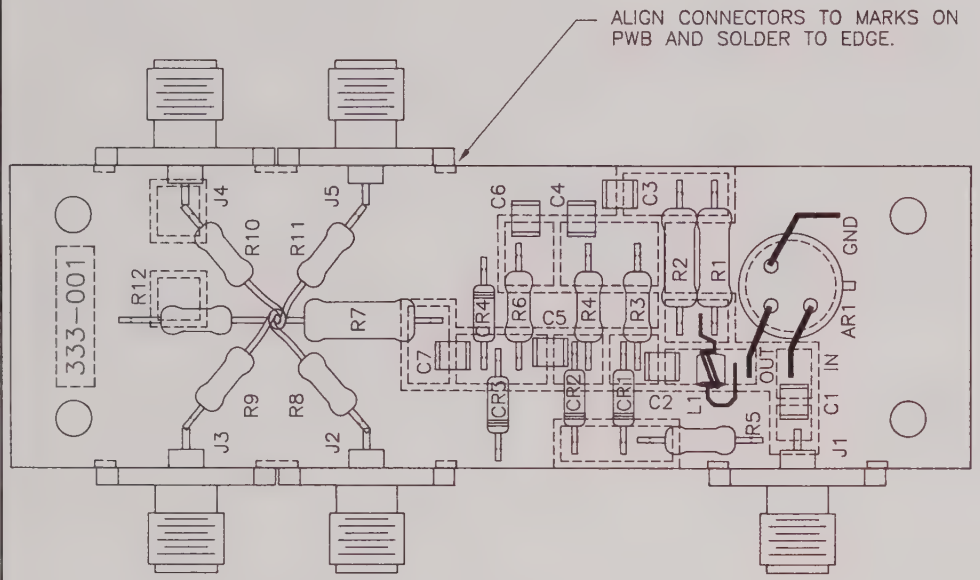
TITLE:
ASSEMBLY, AND WIRING LAYOUT, MODEL – 500FC

DWG NO.	REV.
3-60-408-000	—
FIGURE: ...	DATE 20FEB92



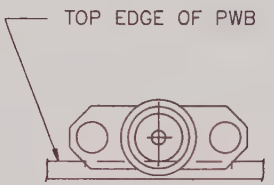
TITLE: INTERCONNECTION DIA., AMPLIFIER, MODEL — 500FC

DWG NO.	REV.
7-38-280-000	A
FIGURE: ...	DATE 26FEB92



-001 SHOWN

(SCALE = 4X)



VIEW A–A

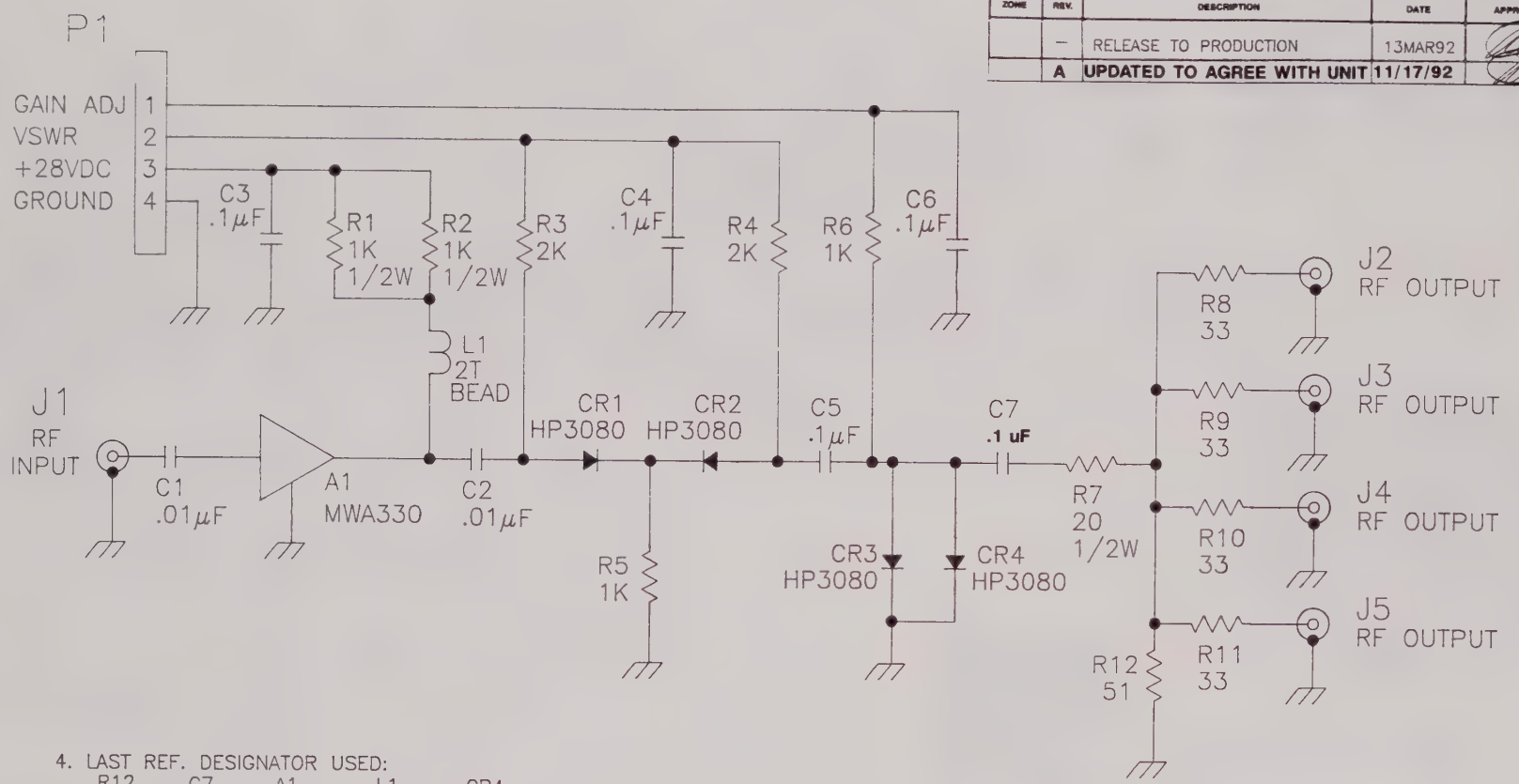
(SCALE = 4X)
(5 PLACES)

5. ...
4. FOR SCHEMATIC, SEE 7–35–625–000.
3. FOR NEXT ASSEMBLY, SEE 4–65–204–001.
2. TOLERANCES: MACHINING = ± 0.005
.XXX = ± 0.010
.XX = ± 0.02
ANGULAR = ± 1/2 DEGREE
1. MATERIALS: SEE SEPARATE PARTS LIST, 'A – SIZE'.

NOTES: UNLESS OTHERWISE SPECIFIED

TITLE: ASSEMBLY, P.W.B., PRE–AMP/SPLITTER MODEL – 500FC	
DWG NO. 4–30–333–001	REV. A
FIGURE: ...	DATE 30MAR92

REVISIONS				
ZONE	REV.	DESCRIPTION	DATE	APPROVED
	–	RELEASE TO PRODUCTION	13MAR92	
	A	UPDATED TO AGREE WITH UNIT	11/17/92	



4. LAST REF. DESIGNATOR USED:
   R12 C7 A1 L1 CR4
3. INDUCTOR VALUES ARE IN MICROHENRIES.
2. CAPACITOR VALUES ARE IN PICOFARADS.
1. RESISTOR VALUES ARE IN OHMS, 1/4W, 5%.

NOTES:
(UNLESS OTHERWISE SPECIFIED)

KALMUS Engineering International, Ltd., U.S.A.

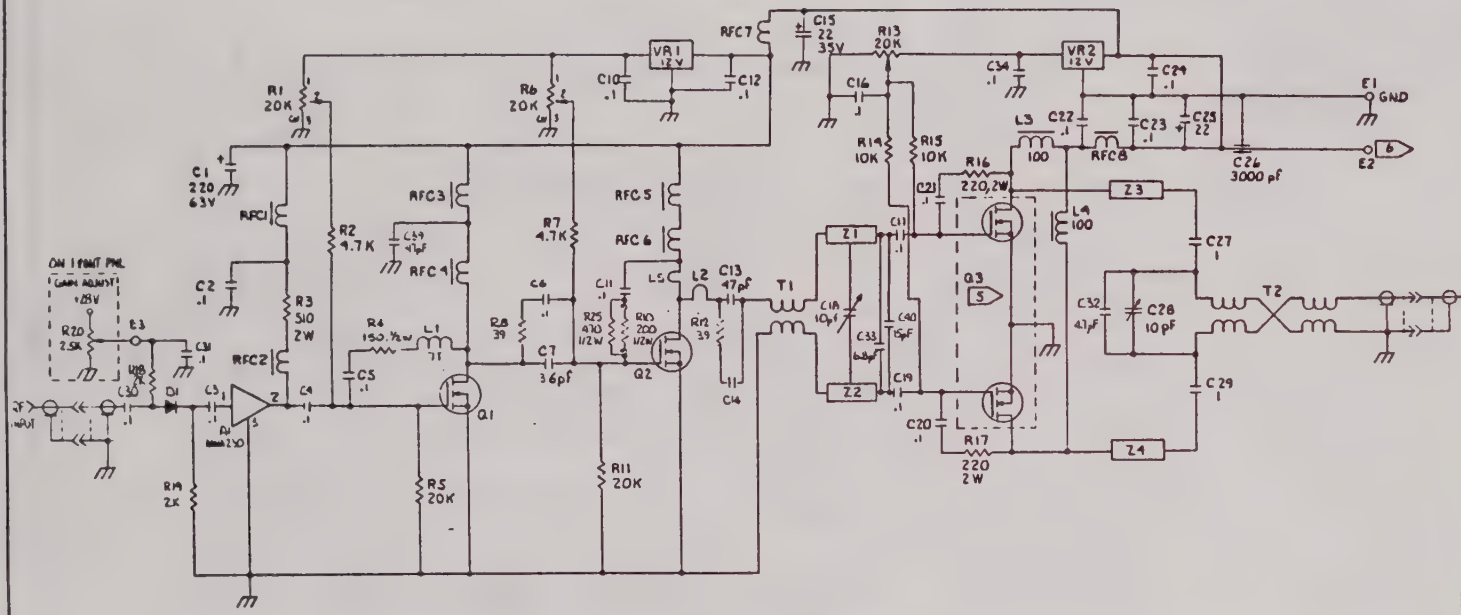
SCALE: FULL	APPROVED BY:	DRAWN BY
DATE: 13MAR92		REVISED

SCHEM., PRE-AMP/SPLITTER,
MODEL – 500FC

DRAWING NUMBER
7-35-625-000

11 X 17 PRINTED ON NO. 1000H CLEARPRINT ®

0010



REV		DESCRIPTION	DATE	APPROVED
	–	RELEASE TO PRODUCTION	09-11-89	
	A	REVISED NOTE 7 IN P/N -266 WAS 263. REVISED CIRCUITRY ADDED TO R18 R19 R20. C30 C31 D1 C32 REVISED NOTE 4 TO ADD R25.	30 JAN 90	
	B	REVISED NOTE 7 ASSY P/N WAS PCB P/N 7-30-266-001	30 APR 90	
	C	DELETED 105F FROM TABLE I	30 MAY 90	
	D	REVISED VALUES C3 C4 C5 C6 C11 C14 C17 C19 C20 C21 WAS .01 C7 WAS 3pF ADDED L5 C33, C34 DELETED 822F FROM TABLE I -002	8 OCT 90	
	E	REVISED VALUES C3 C5 C6 C11 C19 C20 C21 WAS .01 C7 WAS 3pF DELETED 822F FROM TABLE I -002	12 MAR 91	
	F	ADDED C39, C40, R25	13 JAN 92	

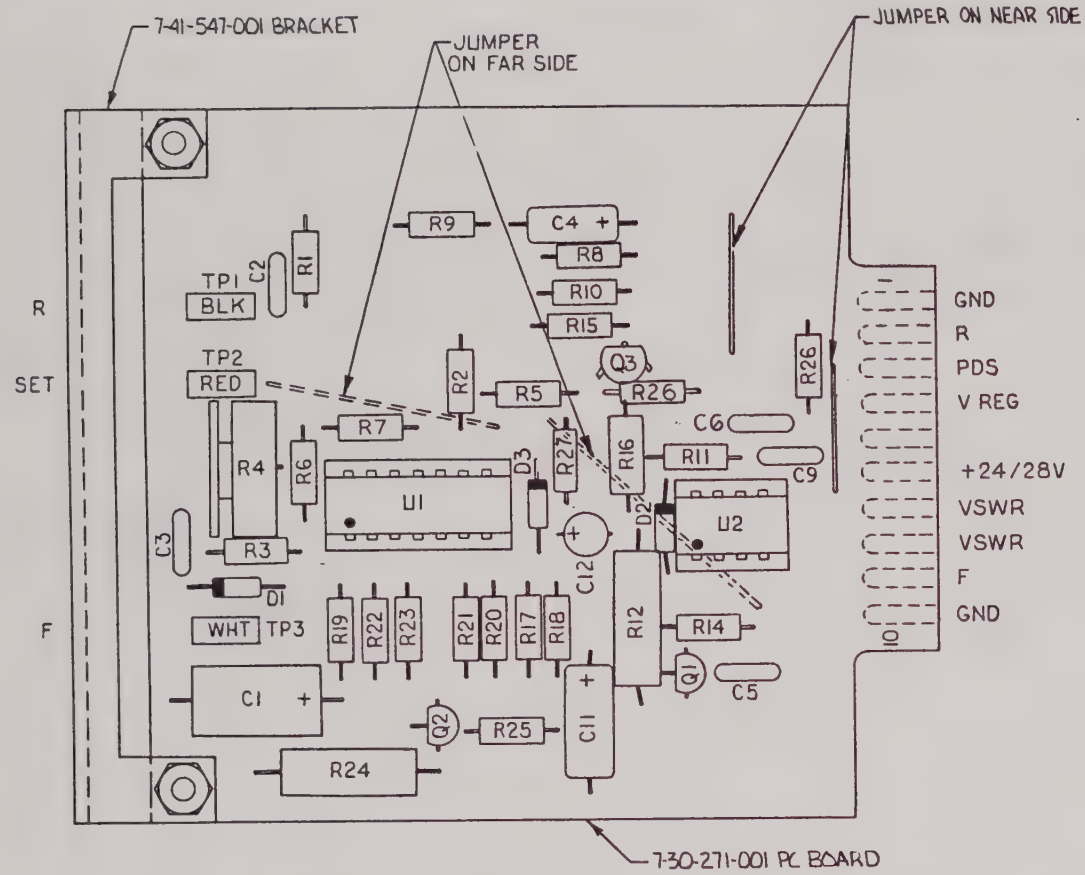
NOTES: UNLESS OTHERWISE SPECIFIED.

1. RESISTOR VALUES ARE IN OHMS ± 5%, ¼ W.
2. CAPACITOR VALUES ARE IN MICROFARADS.
3. INDUCTOR VALUES ARE IN MICROHENRIES.
4. LAST REF DESIGNATOR USED: C40, R25, J2, A1 L5, Q3, RFC8, T2, Z4, VR2, E2, D1.
5. FOR -001 CONFIGURATION, OUTPUT TRANSISTOR, Q3, PART NO IS 7-07-108-001.
   FOR -002 CONFIGURATION, OUTPUT TRANSISTOR, Q3, PART NO IS 7-07-109-001.
6. DC SUPPLY, 24 VDC, FOR -001 CONFIGURATION ONLY.
   DC SUPPLY, 28 VDC, FOR -002 CONFIGURATION ONLY.
7. REFERENCE: PCB P/N. 7-30-266-001 (86087)
   DRILL & TRIM: 7-30-266-001
   ASSY: 3 ea 340-001
8. Z1-Z4 ARE TRACES ON PCB (SIZE TBD)

TABLE I

DASH NO	DASH NO
-001	-002
FREQUENCY	FREQUENCY
1-520MHz	1-520MHz
POWER	POWER
5-10 W	25 W
MODEL	MODEL
	112C
305F	225F
310F	300FC
502F	510F
505F	

		AMPLIFIER, 1-520 MHz, SEE TABLE I		
				– N/A –
		MODEL A	3/9/91	7-35-352-000



REVISION		
E	REDESIGNED & REDRAWN	7-13-88
F	REVISED C12. ADD ASSY NO.	10-4-88
G	CHG 994001 TO 4-30-271-001	2-8-90
H	ADDED R26 & 27, JUMPER FAR SIDE DELETED R13	3 MAY 90
I	DELETED C10	8-13

REF DWG SCHEMATIC: 7-35-384-001
PCB FAB: 7-30-271-001

TOLERANCES (EXCEPT AS NOTED)	REVISIONS NO	DATE	BY
DECIMAL .x	1		
	2		
FRACTIONAL .x	3		
	4		
ANGULAR .x	5		
	6		

KALMUS Engineering International

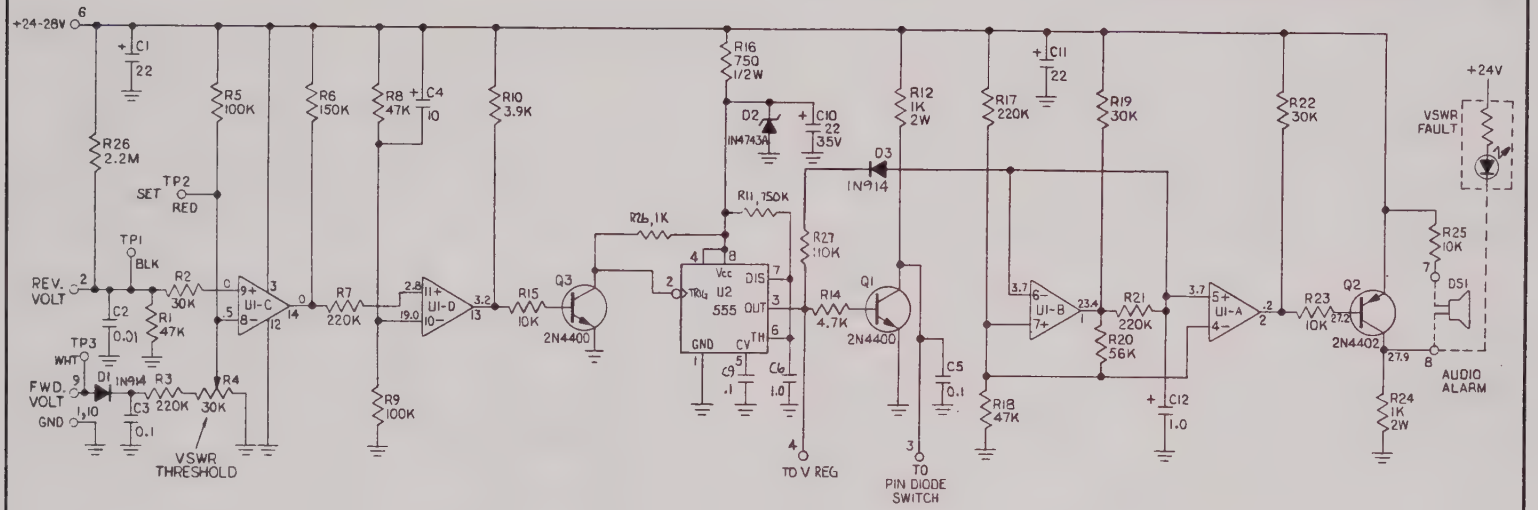
VSWR PROTECTION & RESET ASSEMBLY (A5)

DRAWN BY DAL	SCALE 2/1	MATERIAL
CHK'D	DATE 7-18-88	DRAWING NUMBER 4-30-271-001
TRACED	APP'D	

REDUCTION ON FILE

REVISIONS				
ZONE	REV.	DESCRIPTION	DATE	APPROVED
	G	REVISED CIRCUITRY AROUND U2. DELETED R13; ADDED R26, R27. C2 WAS 0.1	22 MAY 90	
	H	ADDED PCB NO TO NOTE 6	8 OCT 90	

REVISION		
A	DELETED D2 & NOTE 6, CHANGED (7) CAPACITOR VALUES	6-10-87
B	ADDED PIN 4	7-13-87
C	DELETED U2 & ASSOCIATED COMPONENTS	4-29-88
D	EXTESIVE REVISION	7-5-88
E	VALUE C2,C3,C5,C12 (WAS) .47. ADDED NOTE 6	10-11-88
F	CHG FROM 991003 TO T-35-384-001	8-8-90



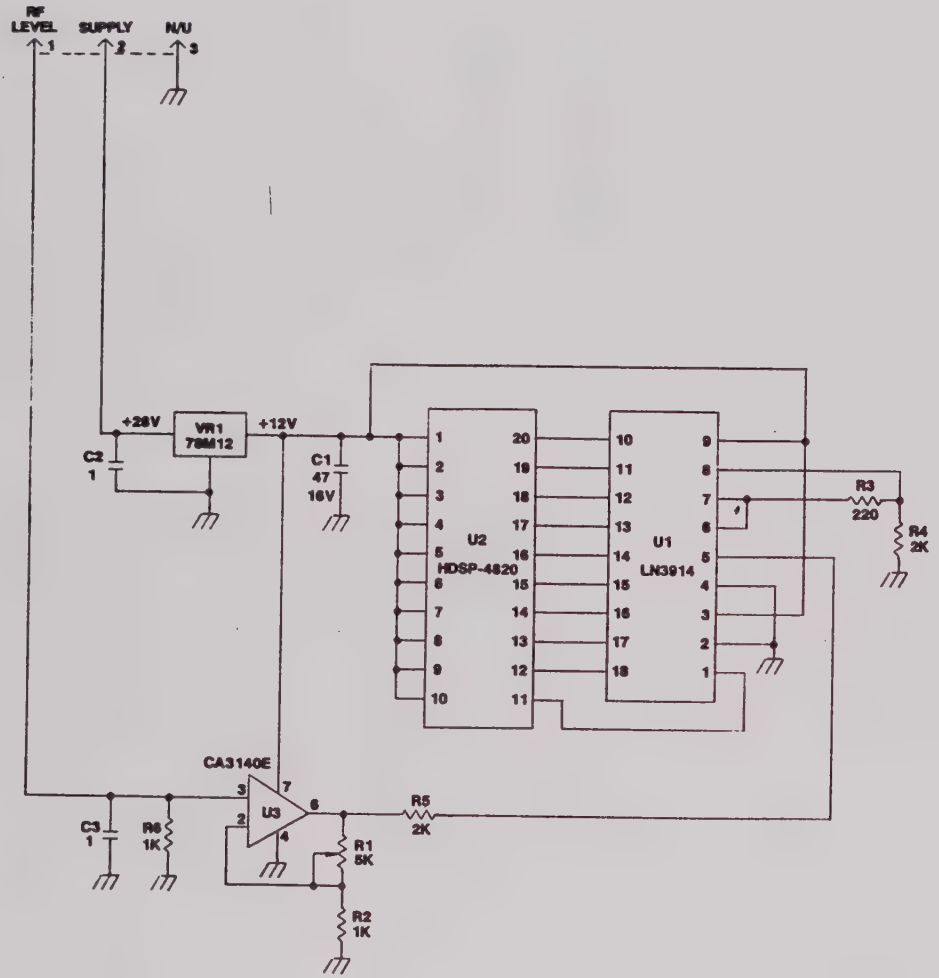
NOTES: UNLESS OTHERWISE SPECIFIED
1. CAPACITOR VALUES ARE IN MICROFARADS
2. RESISTOR VALUES ARE IN OHMS
3. U1 IS LM339M, U2 IS MC1455
4. DIODES D1 & D3 ARE IN914
5. ALL DC VOLTAGES MEASURED TO CHASSIS GND. TAKE IN POWER-ON MODE
6. ASSEMBLY DWG NO: 4-30-271-001
   XCS P/N 7 30-271-001

SCALE NONE	APPROVED BY		DRAWN BY D A L
DATE 3-21-86			REVISED H 8 OCT 90

SCHEMATIC-VSWR PROTECTION & RESET (A5)

DRAWING NUMBER 7-35-384-001

REVISIONS			
	RELEASE TO PRODUCTION	SEP82	



5. REFERENCE DWG: PCB P/N 7-30-326-001
   DRILL & TRIM P/N 7-30-326-001
   ASSY P/N 4-30-326-001
4. LAST REFERENCE DESIGNATOR USED C3,R6,U3,VR1
   DESIGNATOR NOT USED
3. ~~INDUCTOR VALUES ARE IN MICROHENRIES~~
2. CAPACITOR VALUES ARE IN MICROFARADS
1. RESISTOR VALUES ARE IN OHMS ±5%, ¼W
   NOTES: UNLESS OTHERWISE SPECIFIED

SCALE: NONE	APPROVED BY:	DRAWN BY SHUTE
DATE 8 FEB 82	CHECKED BY	REVISED

SCHEMATIC,METER CIRCUIT BOARD

DRAWING NUMBER 7-35-617-001

INSTRUCTION MANUAL

REGULATED POWER SUPPLIES

LFS-43 SERIES

SPECIFICATIONS AND FEATURES

DC OUTPUT — Voltage regulated for line and load. For voltage and current ratings see table I below.

TABLE I

MODEL	VOLTAGE RANGE	MAXIMUM CURRENT (AMPS) AT AMBIENT TEMPERATURE		
		40°C	50°C	60°C
LFS-43-2	2 ± 5%	40.0	33.5	25.0
LFS-43-5	5 ± 5%	40.0	33.5	25.0
LFS-43-6	6 ± 5%	35.0	28.0	20.5
LFS-43-12	12 ± 5%	19.0	15.0	11.0
LFS-43-15	15 ± 5%	15.5	12.0	9.0
LFS-43-20	20 ± 5%	11.8	9.2	6.8
LFS-43-24	24 ± 5%	10.0	7.8	5.7
LFS-43-28	28 ± 5%	8.6	6.8	5.0
LFS-43-48	48 ± 5%	5.0	4.0	3.0

Current range must be chosen to suit the appropriate maximum temperature. Current ratings apply for entire voltage range.

REGULATED VOLTAGE OUTPUT

Regulation (line) ..... 0.1% from 95 to 132 VAC or 187 to 265 VAC or 260-370 VDC.

Regulation (load) ..... 0.1% from 0 to full load.

Ripple and Noise ..... 15 mV rms, 75 mV peak-to-peak for LFS-43-2, -5 and -6; 20 mV rms, 150 mV peak-to-peak for LFS-43-12 through LFS-43-28; 35 mV rms, 200 mV peak-to-peak for LFS-43-48 (20 MHz bandwidth measurement system). Ripple specifications apply for output terminals floating or with either positive or negative terminal grounded.

Temperature Coefficient ..... 0.03% per °C

Remote Programming

External Resistor ..... Nominal 1000 Ohms/volt output. Increasing resistance increases output voltage. Use a low temperature coefficient resistor to assure most stable operation.

Programming Voltage ..... One-to-one voltage change. The programming supply must have a reverse current capability of 2 ma min.

Remote Sensing ..... Provision is made for remote sensing to eliminate the effect of power output lead resistance on DC regulation. Sensing leads should be a twisted pair to minimize AC pickup. A 10 μf elect, capacitor may be required between output terminals and sense terminals to reduce noise pickup. An additional capacitor may also be required across the load to further reduce noise pick up; the value of this capacitor will depend upon the particular application.

OVERSHOOT — No overshoot under conditions of power turn-on, turn-off, or power failure.

AC INPUT — 95 to 132 volts AC at 47 to 440 Hz, or 187 to 265 VAC at 47 to 440 Hz via field selectable jumper. (When shipped from factory, all LFS-43 power supplies are wired for 95 to 132 VAC input. To configure for 187 to 265 VAC input, remove jumper between P.C. Board terminals 'A' and 'B'). Where applicable, regulatory agency approval applies only for input voltages up to 250 VAC and for input frequencies in the range 47-63 Hz. Leakage current in the ground connection may exceed the limits allowed by these agencies at frequencies above this range.

DC INPUT — 260 to 370 volts DC (unit must be configured for 187 to 265 VAC as described above). Where applicable, regulatory agency approval only applies for input voltages up to 350 VDC.

EFFICIENCY — LFS-43-2 55% minimum, LFS-43-5 through LFS-43-15 75% minimum, LFS-43-20 through LFS-43-48 80% minimum.

INRUSH LIMITING — Turn on inrush current will not exceed 40 amps peak. (Note that LFS-43 power supplies employ a thermistor in their inrush limiting circuit; allow one minute cool down time before reapplying power).

OVERLOAD PROTECTION — Automatic electronic current limiting circuit limits the output current to a preset value, thereby providing protection for the load as well as the power supply. The current limit characteristic exhibits a region of constant current behavior (down to approximately 50% Vo (nominal)) followed by a foldback region.

HOLD UP TIME — LFS-43-2, LFS-43-5 and LFS-43-6 models will remain within regulation limits for at least 16.7 msec after loss of AC power when operating at maximum output power and 105 VAC input at 60 Hz, (or when configured for 220 V input: 20 msec holdup when operating at maximum output power and 210 VAC input at 50 Hz).

RECOMMENDED FUSING — 12 A, 250 V normal blow fuse in AC line (not supplied in unit) for 110 VAC input. Use 6V, 250 V for 220 VAC input. If IEC type fuses are used, value should be 75% of recommended current rating.

INPUT AND OUTPUT CONNECTIONS — See outline drawing for location. AC input, sensing and remote on/off connections are made via PC board mounted terminal blocks. Ground connection is made via a chassis mounted solder terminal. DC output connections are made via heavy duty bus bars.

REMOTE TURN-ON/TURN-OFF — T^2L compatable signal enables remote turn-on/off of the power supply. A voltage of 2.8 to 5.0 V applied between "+R" and "-R" will initiate turn-off. Open circuit or short circuit condition, or a zero to 0.5 volt signal will cause turn-on.

COOLING — Convection cooled; no external blowers required.

OPERATING AMBIENT TEMPERATURE RANGE AND DUTY CYCLE — Continuous duty from 0°C to +60°C ambient with corresponding load current ratings for all modes of operation. Unit will start up at -10°C, but may not meet published specs until internal heating raises temperature to 0°C.

STORAGE TEMPERATURE — -55°C to +85°C

DC OUTPUT CONTROL — Screwdriver voltage adjust control permits adjustment of DC output voltage. See outline drawing for location of control.

WARRANTY — 1 year warranty from date of shipment . . . materials and labor

PHYSICAL DATA

Size	1.9" x 4.75" x 9.125"
Weight	3.0 lbs. net; 4.0 lbs. shipping
Finish	Gray, FED.STD.595 No. 26081

MOUNTING — One surface with threaded mounting holes can be utilized for mounting this unit. All LFS-43 power supplies must be mounted in a horizontal plane with 4.75" dimension vertical. Air circulation is required when unit is mounted in confined areas. Refer to outline drawing for mounting details.

OVERVOLTAGE PROTECTION — Standard on all models. When output voltage increases above the maximum overvoltage detect of the unit and is removed, input power must be removed. Maximum overvoltage detect level: LFS-43-2, 4.2 V, LFS-43-5, 6.85 V, LFS-43-6, 7.6 V, LFS-43-12, 14.9 V, LFS-43-15, 19.3 V, LFS-43-20, 26.5 V, LFS-43-24, 31.5 V, LFS-43-28, 36.7 V, LFS-43-48, 60.6 V. Allow 0.5 min. for the overvoltage detector to reset and then reconnect input power for normal operation of the unit.

ISOLATION RATINGS — Input terminals to output: 3750 V rms
Input terminals to ground: 1500 V rms
Output terminals to ground: 500 V rms

ACCESSORIES

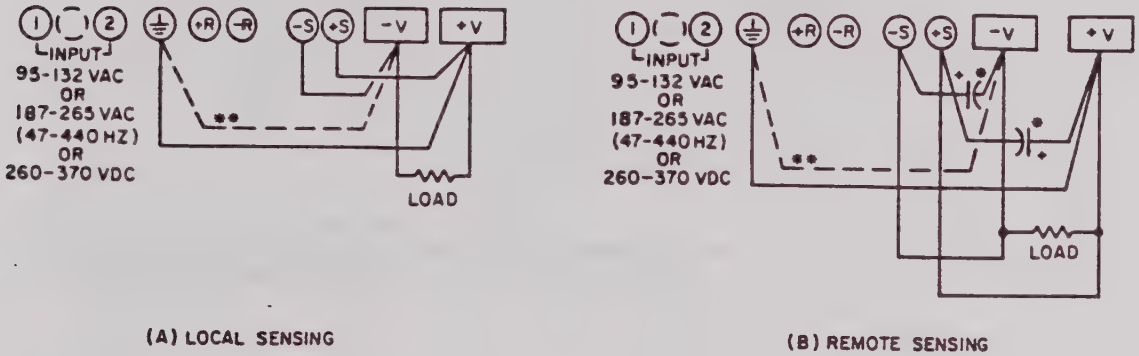
Rack Adapters	Rack adapters LRS-15 and LRA-17, with or without chassis slides, are available for all LFS-43 units.
Standard Power Systems	All LFS power supplies can be integrated into the Lambda standard power system assembly which provides panel mounted pilot light, voltage control, fuse and output metering for the power supply as desired.

SUPPLY — LOAD CONNECTIONS — See figures 1-3.

NOTE: In certain applications a toroid such as Stackpole no. 57-3206 may be required on the output grounding wire for noise reduction. The number of turns required will depend upon the particular grounding configuration used.

EMI — LFS-43 power supplies can be made to meet FCC docket 20780, class A conducted EMI compliance with the addition of LAMBDA filter ARA-00-025 or CORCAM filter No. 6ET1. Filter required for meeting VDE 0871 class A compliance with 187-250 VAC input voltage is LAMBDA filter ARA-00-025 or CORCOM filter No. 16ET1.

If the P.C. board(s) are removed from the chassis, the silicone rubber insulator sheet(s) must be replaced with new silicone insulator(s). HSD-00-506; HSD-00-508.



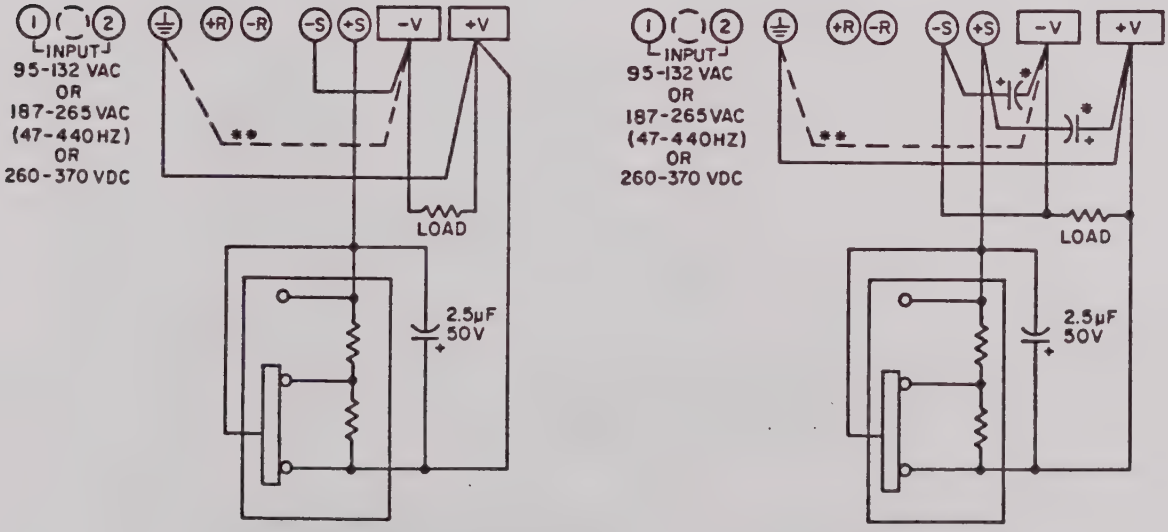
(A) LOCAL SENSING

(B) REMOTE SENSING

* A 10μF, ELECT. CAP MAY BE REQUIRED.

** FOR NEGATIVE GROUND, DISCONNECT JUMPER FROM TERMINALS ⏚ AND +V AND RECONNECT TO TERMINALS ⏚ AND -V

Figure 1. DC Output Connections



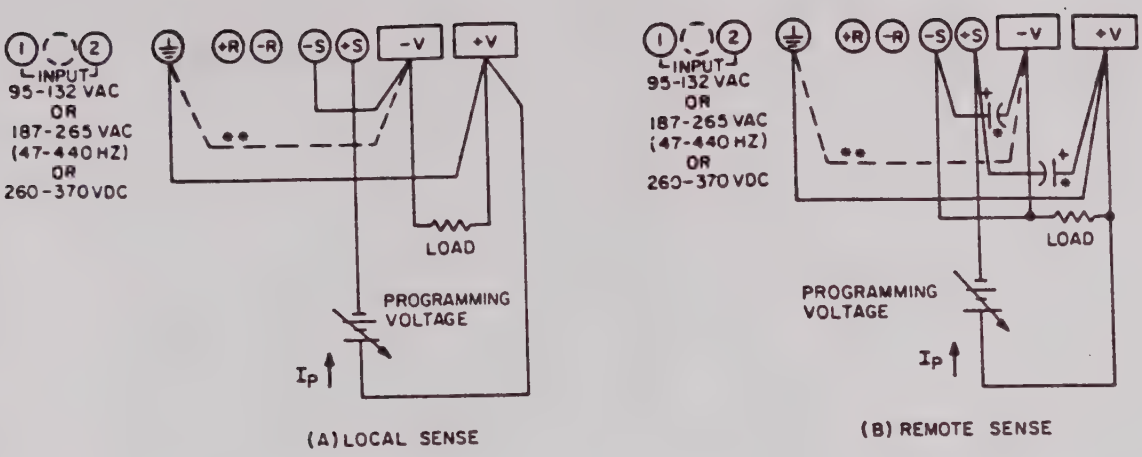
(A) LOCAL SENSING

(B) REMOTE SENSING

* A 10μF, ELECT CAP MAY BE REQUIRED.

** FOR NEGATIVE GROUND, DISCONNECT JUMPER FROM TERMINALS ⏚ AND +V AND RECONNECT TO TERMINALS ⏚ AND -V.

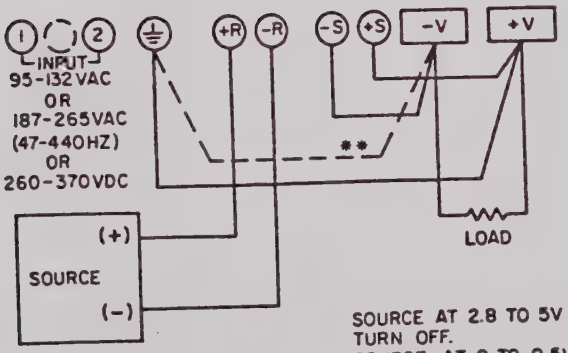
Figure 2. Programmable Voltage, With External Resistor



*A 10μF, ELECT CAP MAY BE REQUIRED.

**FOR NEGATIVE GROUND DISCONNECT JUMPER FROM TERMINALS ⏚ AND +V AND RECONNECT TO TERMINALS ⏚ AND -V.

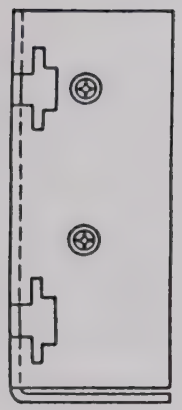
Figure 3. Programmable Voltage, With External Voltage Source

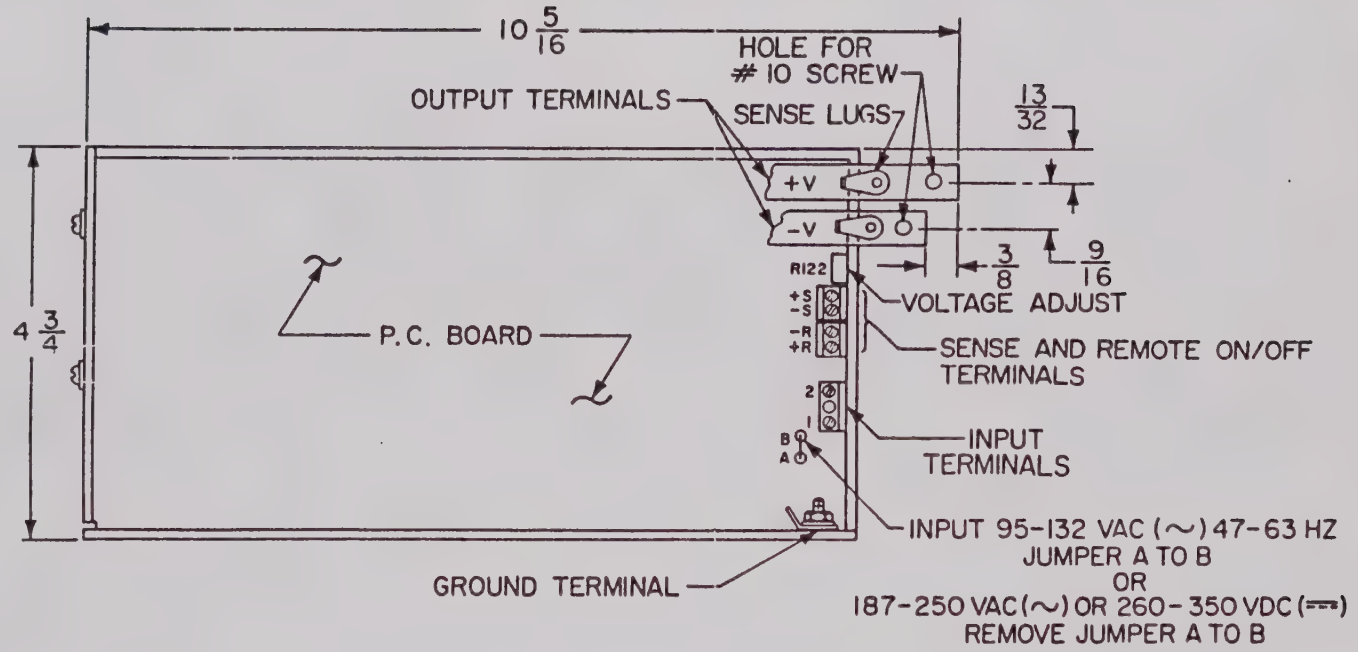


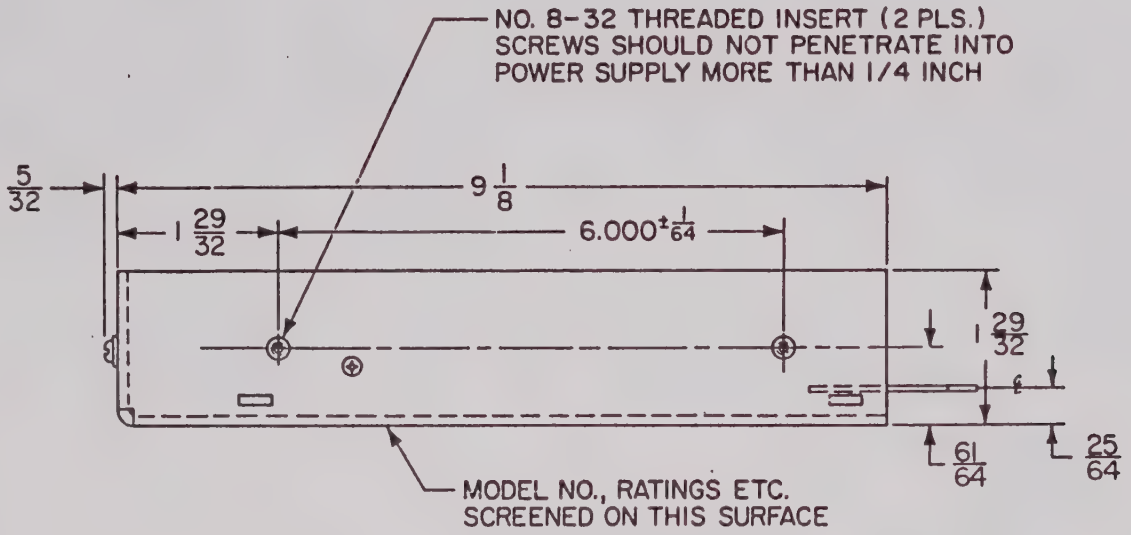
SOURCE AT 2.8 TO 5V WILL INITIATE TURN OFF.
SOURCE AT 0 TO 0.5V, OPEN CIRCUIT, OR SHORT CIRCUIT AT +R TO -R WILL INITIATE TURN ON.

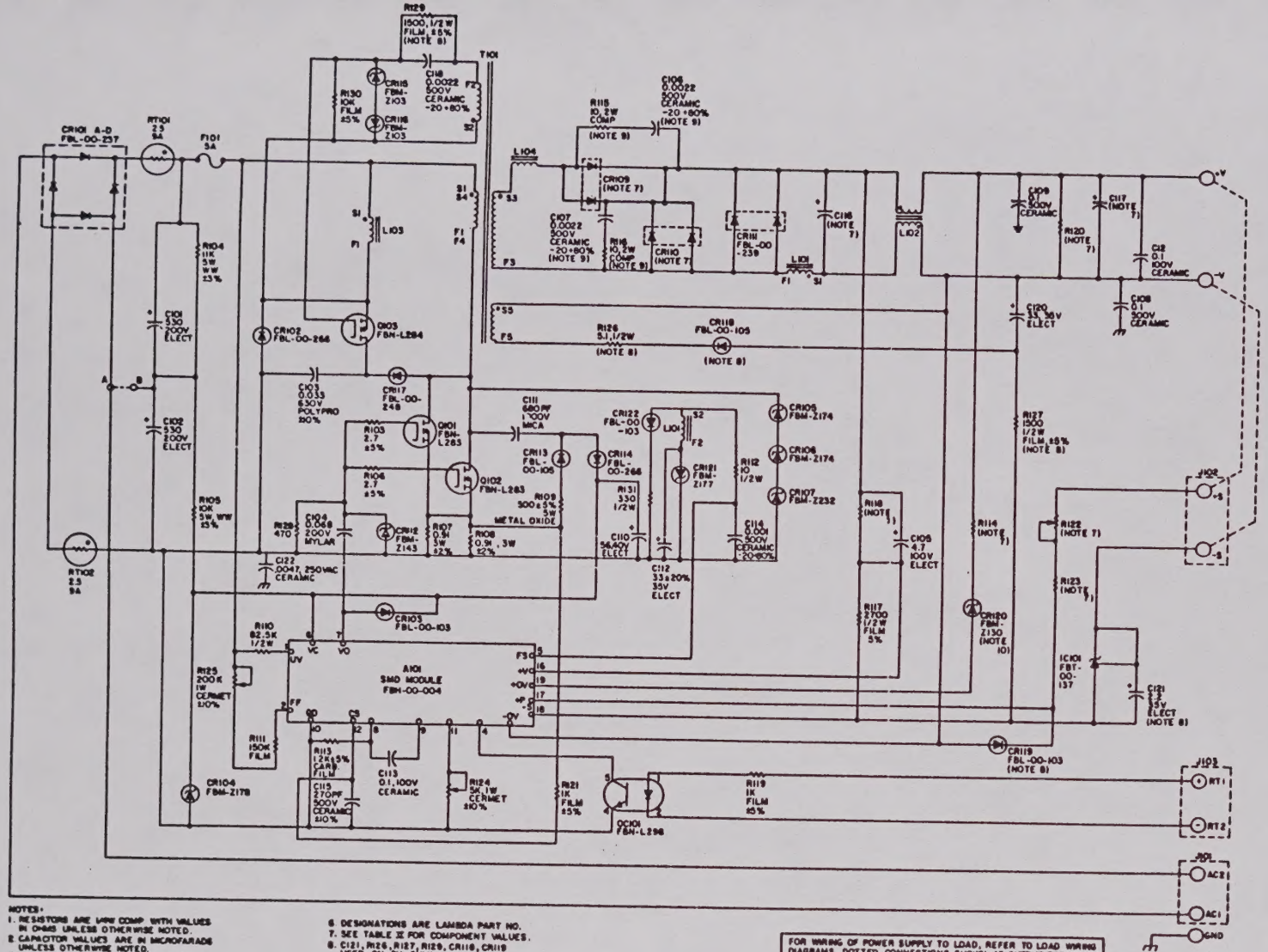
**FOR NEGATIVE GROUND DISCONNECT JUMPER FROM TERMINALS ⏚ AND +V AND RECONNECT TO TERMINALS ⏚ AND -V.

Figure 4. Remote Turn-On/Turn-Off




10 5/16
HOLE FOR
10 SCREW
OUTPUT TERMINALS
SENSE LUGS
13/32
+V
-V
3/8
9/16
R122
VOLTAGE ADJUST
+S
-S
-R
+R
SENSE AND REMOTE ON/OFF
TERMINALS
4 3/4
P.C. BOARD
2
1
B
A
INPUT
TERMINALS
INPUT 95-132 VAC (~) 47-63 HZ
JUMPER A TO B
OR
187-250 VAC(~) OR 260-350 VDC (⎓)
REMOVE JUMPER A TO B
GROUND TERMINAL


NO. 8-32 THREADED INSERT (2 PLS.)
SCREWS SHOULD NOT PENETRATE INTO
POWER SUPPLY MORE THAN 1/4 INCH
5/32
9 1/8
1 29/32
6.000±1/64
1 29/32
61/64
25/64
MODEL NO., RATINGS ETC.
SCREENED ON THIS SURFACE



NOTES:
1. RESISTORS ARE WW COMP WITH VALUES IN OHMS UNLESS OTHERWISE NOTED.
2. CAPACITOR VALUES ARE IN MICROFARADS UNLESS OTHERWISE NOTED.
3. RESISTOR TOLERANCES: COMP, ±10% WIREWOUND ±3%, FILM ±1%
4. CAPACITOR TOLERANCES: ELECTROLYTIC -10 +100%, CERAMIC ±20%, MYLAR ±10% MICA ±3% UNLESS OTHERWISE NOTED.
5. SYMBOLS:
   - ▭ INDICATES ACTUAL UNIT MARKING
   - ! INDICATES CLOCKWISE ROTATION OF SHAFT.
   - —o— INDICATES TERMINAL ON PRINTED WIRING BOARD OR TERMINAL BOARD
   - ● INDICATES ADJUSTMENT OR CALIBRATION CONTROL
   - * SEE INSTRUCTION MANUAL.
6. DESIGNATIONS ARE LAMBDA PART NO.
7. SEE TABLE II FOR COMPONENT VALUES.
8. C121, R126, R127, R129, CR118, CR119 USED ON 2V ONLY
9. C106, C107 ARE 470PF, 1000V, MICA ±20% ON 48V. R115, R116 ARE 50 3W, WW ON 48V.
10. CR120 USED ON 48V ONLY.

FOR WIRING OF POWER SUPPLY TO LOAD, REFER TO LOAD WIRING DIAGRAMS. DOTTED CONNECTIONS SHOWN AT OUTPUT TERMINALS INDICATE JUMPERS IN PLACE FOR LOCAL SENSING CONNECTIONS.

SCHEMATIC DIAGRAM
REGULATED POWER SUPPLY
LFS-43

LAMBDA
ELECTRONICS
MELVILLE, NEW YORK
DIVISION OF VOCO INSTRUMENTS INC